

AMENDMENTS TO THE DRAWINGS

The attached sheet of drawings includes changes to FIG. 1. This sheet, which includes FIG. 1, replaces the original sheet including FIG. 1. In FIG. 1, previously omitted legend "Prior Art" has been added.

Attachments: Replacement Sheet
 Annotated Sheet Showing Changes

REMARKS

Claims 1-19 remain pending in the application. Claims 1, 13, and 19 are currently amended. Applicants respectfully request for allowance of all pending claims based on the following discussions.

Correction of Title of Record

It has come to the attention of Applicants that the title of record “PUMPING SYSTEM” is inconsistent with the title as filed “A PUMPING SYSTEM.” Applicants respectfully request that the title of record be changed to “A PUMPING SYSYEM” in order to ensure the consistency of the file. Applicants believe that the need for correction is not due to any error by Applicants and that no additional fee is due for such correction.

Claim Objections

Claims 1, 13, and 19 are objected to because of certain informalities. In response, claim 1 has been amended by replacing “is adapted to cause” with “causes”, claim 13 by inserting “,” between “condition” and “the power”, and claim 19 by replacing “said” with “a” before “monitored state” at its first appearance in the claim. As such, Applicants respectfully request that the objections be withdrawn.

Rejections under 35 USC 102

Claims 1-5, 7, 8, and 12-19 are rejected under 35 USC 102(b) as being anticipated by US Patent No. 6,244,825 to Sasaki et al. (hereinafter referred to as “Sasaki”).

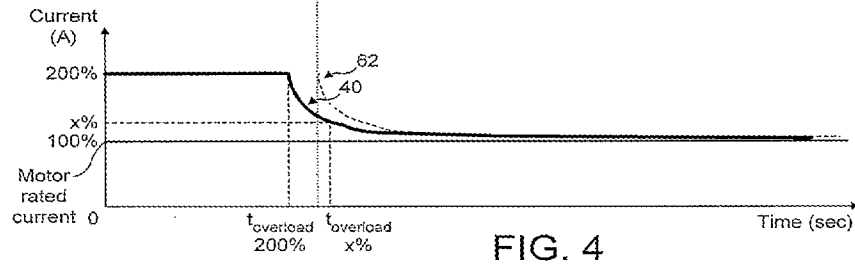
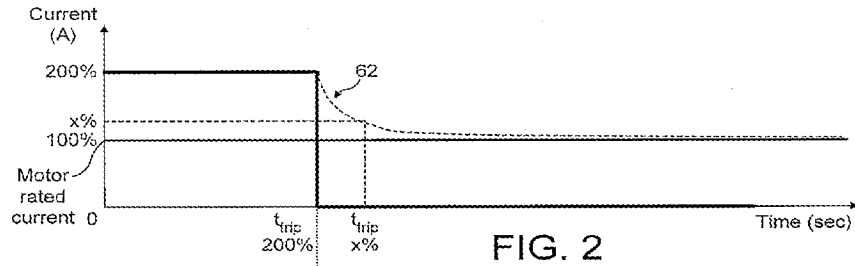
Independent claim 1 is directed to a pumping system comprising: a pumping mechanism; a motor for driving the pumping mechanism; a drive control for controlling the motor; and means for monitoring at least one state within the system; wherein the drive control causes the system to operate for transient periods in an overload condition

and to control the power to the motor when the system is operating in said overload

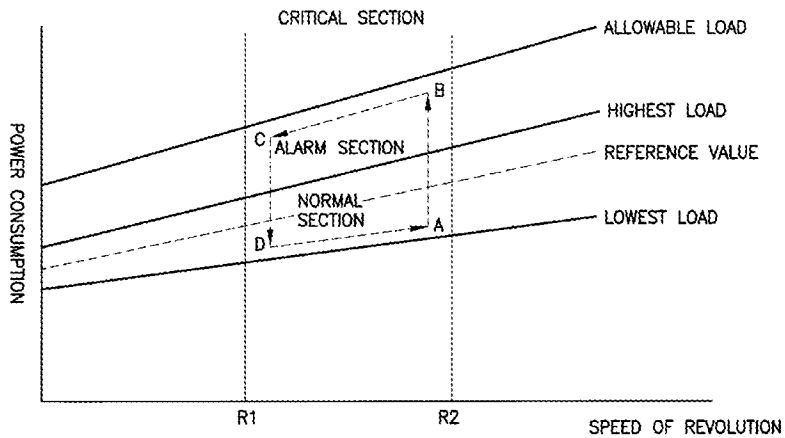
condition dependent on the level of said monitored state so as to avoid said state from

exceeding said operational limit.

The claimed invention has the advantage of improving the performance of a vacuum pump by running it in an overload condition, while protecting it from overstepping its operational limit, such as overheating. As shown in FIG. 2 of the application, conventionally, when a vacuum pump operates in an overload condition, heat gradually builds up to a point exceeding an operational limit, triggering a protective circuitry to completely cut off the power supply to the pump. As a result, the abrupt shot down can significantly disrupt a manufacturing process involving the vacuum pump. In the claimed invention as shown in FIG. 4 of the application, the vacuum pump is maintained in an overload condition for a transient period. When the heat generated by the pump exceeds an operational limit, instead of shutting down the pump, the claimed invention gradually reduces the power supply to the pump, thereby minimizing the disruption it may cause to the manufacturing process. Through out the transient period, the vacuum pump is always in an overload condition, even during the reduction process of the power supply. As a result, the performance of the vacuum pump can be improved, while minimizing a potential disruption the pump may cause to a manufacturing process.



Sasaki teaches an apparatus and method for protecting a vacuum pump from being overloaded. *See, the abstract.* As shown in FIG. 4 of Sasaki, if for any known or unknown reasons, the power consumption of the vacuum pump increases from point A to point B, Sasaki will reduce the pump speed from R2 to R1, and wait for the power consumption to drop from point C to point D. *See, col. 4, lines 12-61.*



Sasaki fails to teach “the drive control causes the system to operate for transient periods in an overload condition.” As discussed above, Sasaki’s vacuum pump is configured to avoid overloading. It is true that Sasaki’s vacuum pump may enter an overload condition for any know or unknown reasons. However, the drive control of Sasaki’s vacuum pump is not programmed to purposefully cause the pump to operate in an overload condition. Such design simply contradicts Sasaki’s objective that is to prevent the vacuum pump from being overloaded.

Furthermore, Sasaki’s vacuum pump operates in both alarm and normal sections during the transient period. *See, FIG. 4 of Sasaki.* In the normal section, Sasaki’s vacuum pump is not overloaded. This differs from the claimed invention where the pump operates in the overload condition during the entire transient period. As shown in FIG. 4 of the application, the vacuum pump operates above the 100% current level for the entire transient period.

It would not have been obvious for a person skilled in the art to modify Sasaki into the claimed invention, because it teaches away from the claimed invention. As discussed above, the claimed invention is about improving the pump performance by purposefully operating the vacuum pump in an overload condition, whereas Sasaki is about protecting the vacuum pump from being overloaded by reducing the pump speed when the pump drifts into the overload condition. The totality of the prior art must be considered, and proceeding contrary to accepted wisdom in the art is evidence of nonobviousness. *In re Hedges, 783 F.2d 1038 (Fed. Cir. 1986).* The fact that the claimed invention purposefully seeks to operate the vacuum pump in the overload

condition is contrary to the accepted wisdom of Sasaki, and therefore is evidence of nonobviousness.

As such, Applicants respectfully submit that claim 1 is patentable over Sasaki. Accordingly, claims 2-5, 7, 8, and 12-18 that depend from claim 1 and include all the limitations recited therein are also patentable over Sasaki. Independent claim 19 includes similar limitations to claim 1. For the reasons discussed above, Applicants respectfully submit that claim 19 is also patentable over Sasaki.

Claims 9-12 and 14 are rejected under 35 USC 102(b) as being anticipated by the FIGs. 1 and 2 of the present application.

Since claims 9-12 and 14 include all the limitations recited in claim 1, Applicants respectfully submit that they are patentable over FIGs. 1 and 2 of the present application by virtue of their dependency on claim 1.

Rejections under 35 USC 103

Claims 9 and 10 are rejected under 35 USC 103(a) as being unpatentable over Sasaki in view of US Patent No. 4,4756,423 to Mallick Jr. et al. (hereinafter referred to as “Mallick”).

Since claims 9 and 10 include all the limitations recited in claim 1, Applicants respectfully submit that they are patentable over Sasaki and Mallick by virtue of their dependency on claim 1.

Allowable Subject

Application No.: 10/588,466

Response dated July 20, 2010 Reply to Office Action of March 30, 2010

Attorney Docket No.: M03B171

Applicants acknowledge with thanks that claim 6 is allowable, if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

CONCLUSION

Applicants have made an earnest attempt to place this application in an allowable form. In view of the foregoing remarks, it is respectfully submitted that the pending claims are drawn to a novel subject matter, patentably distinguishable over the prior art of record. Examiner is therefore, respectfully requested to reconsider and withdraw the outstanding rejections.

Should Examiner deem that any further clarification is desirable, Examiner is invited to telephone the undersigned at the below listed telephone number.

Applicants do not believe that any additional fee is due, but as a precaution, the Commissioner is hereby authorized to charge any additional fee to deposit account number 50-4244.

Respectfully submitted,

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